Benthic Macroinvertebrate Field Data Sheet (front)

Station ID:	_____	Ecoregion:	_____	Land Use	_____
Field Team:	_____	Survey Reason:	_____	Start Time:	__:__
Stream Name:	_____	Location:	_____	Finish Time:	__:__

Date: __/__/__   Latitude: _____   Longitude: _____

Stream Physicochemical Measurements

Instrument ID number: _____   pH: _____

Temperature: _____° C

Conductivity: _____uS/cm

Dissolved Oxygen: _____mg/l

Did instrument pass all post-calibration checks? Y / N

If NO - which parameter(s) failed and action taken: _____

Benthic Macroinvertebrate Collection

Method used	(circle one)	Single Habitat	(Riffle)		Multi Habitat	(Logs, plants, etc)
Riffle Quality	(circle one)	Good	Marginal	Poor	None	
Habitats sampled	(circle one)	Riffle	Snags	Banks	Vegetation	

jabs   _____   _____   _____   _____   Area Sampled (sq. m.): _____

Weather Observations

Current Weather	(circle one)	Cloudy	Clear	Rain/Snow	Foggy	
Recent precipitation	(circle one)	Clear	Showers	Rain	Storms	Other _____
Stream flow	(circle one)	Low	Normal	Above Normal	Flood	

Biological Observations

0 1 2 3	Periphyton	0 1 2 3	Salamanders	0 1 2 3	Other....
0 1 2 3	Filamentous algae	0 1 2 3	Warmwater Fish	0 1 2 3	_____
0 1 2 3	Submerged Macrophytes	0 1 2 3	Coldwater Fish		0 = Absent
0 1 2 3	Emergent Macrophytes	0 1 2 3	Beavers		1 = Sparse
0 1 2 3	Crayfish	0 1 2 3	Muskrats		2 = Common to Abundant
0 1 2 3	Corbicula	0 1 2 3	Ducks/Geese		3 = Dominant -
0 1 2 3	Unionidae	0 1 2 3	Snakes		
0 1 2 3	Operculate Snails	0 1 2 3	Turtles		
0 1 2 3	Non-operculate Snails	0 1 2 3	Frogs/Tadpoles		

abnormally high density where other taxa are insignificant in relation to the dominant taxa. There can be situations where mulitiple taxa are dominant such as algae and snails.

NOTES: _____

HighGradient Habitat Data Sheet

1. Epifaunal Substrate/Available Cover

Optimal	Suboptimal	Marginal	Poor
Greater then 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e. logs/snags that are not new fall and not tranisent).r	40-70% mis of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colinzation (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; sbustrate frequently disturbed or removed.	Less than 20% stable habitat lack of habitat is obvious; substrate unstable or lacking.

SCORE: 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0

2. Embeddedness

Optimal	Suboptimal	Marginal	Poor
Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder paricles are more thatn 75% surrounded by fine sediment.

SCORE: 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0

3. Velocity/Depth Regime

Optimal	Suboptimal	Marginal	Poor
CoverAll four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). Slow is <0.3 m/s, deep is >0.5 m/s.	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 veolcity/depth regime (usually slow-deep).

SCORE: 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0

4. Sediment Deposition

Optimal	Suboptimal	Marginal	Poor
Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent.

SCORE: 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0

	Optimal	Suboptimal	Marginal	Poor
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutements; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 - 80% of stream reach channelized and disrupted.	Banks shored with gabion or cementl over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

	Optimal	Suboptimal	Marginal	Poor
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequenl ratio of distance btw. riffle divided by width of the stream <7:1 *generally 5 to 7): variety of habitats if key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance btw. riffles divided by the width of the stream is btw. 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance btw. riffles divided by the width of the stream is btw. 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance btw. riffles dividied by the width of the stream is a ration of >25%.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

	Optimal	Suboptimal	Marginal	Poor
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas "raw" areas
SCORE LB	10 9	8 7 6	5 4 3	2 1 0
SCORE RB	10 9	8 7 6	5 4 3	2 1 0

	Optimal	Suboptimal	Marginal	Poor
9. Vegetative Protection (score each bank)	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of stream bank surfaces covered by native vegetation, bnut one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less then one-half of the potential plant stuibble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 cm or less in average stubble height.
SCORE LB	10 9	8 7 6	5 4 3	2 1 0
SCORE RB	10 9	8 7 6	5 4 3	2 1 0

	Optimal	Suboptimal	Marginal	Poor
10. Riparian Vegetative Zone Width (score each bank)	Width of riparian zone >18 m; human activities (i.e. parking lots, roadbaeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 m; human activites have impacted zone only minimally.	Width of riparian zone 6-12 m: human activiteid have impacted zone a great deal.	Width if riparian zone <6 m; little or no riparian vegetation due to human activities.
SCORE LB	10 9	8 7 6	5 4 3	2 1 0
SCORE RB	10 9	8 7 6	5 4 3	2 1 0

SCORE _____